violet blue, and being kept in a corked bottle, it may be kept without any alteration, although it is exposed to different temperatures, and even to the rays of the sun: as a re-agent it is preferable to the best syrup of violets, 100 parts of the syrup contain 66 of sugar, which frequently contains lime; in 100 parts of the pickle there are only 25 of salt. There is some reason to suppose that several other blue flowers, such as those of flag, larkspur, &c. would also yield a pickle of sufficient accuracy: the latter indeed has been tried with complete success.

In order to use this blue pickle, the end of a small splinter, or a broken match is dipped in it, and then applied to a plate. By repeating this manœuvre the middle of a plate will hold thirty spots for trial, each of which does not consume a quarter of a drop, so that a few decigramms of this pickle will serve to make numerous experiments in the course of the year.

2d Part....It appears that in general the usefulness of applying common salt to preserve those vegetables, which are brought from a distance, for the use of apothecaries or perfumers, has not been sufficiently appreciated. Hilaire Marin Rouelle, under whom the author was educated, perfumed his laboratory, during the whole of a course of chemistry in the winter of 1775, by distilling the roses he had salted in the preceding June. The rose water that he obtained from them formed, by the addition of a little sugar and alcohol, a very pleasant liquor. A vessel filled with salted roses has been kept for the last three years in the author's laboratory, the perfume of these roses has not lost any of its agreeableness or of its strength. The salting was performed in the following manner.

Take a chiliogramme and a half (3 lb.) of roses, rub them for two or three minutes with half a chiliogramme (1 lb.) of salt. The flowers being bruised by the friction of the grains of the salt, yield their juice, so that there is immediately formed a kind of paste that is not very bulky; and this is to be put by in an earthern jar, or in a barrel, until it is filled, by repeating the same process, by which means all the roses will be equally salted in a proper manner. The vessel is then to be shut up and kept in a cool place, until it is wanted.

When it is desired, at any leisure time, to begin the distillation, this aromatic paste is to be put into the body of the still along with twice its weight of water. By this means there is no occasion to be hurried by the season, nor to pay any attention to the distance, as a person at Paris may distil during the winter, the aromatic vegetables, which were salted, a long time before in the provinces most distant from the capital.

According to some observers the distilled waters obtained in this way are much more agreeable, than the common, and nevertheless they yield more essential oil. It may however be affirmed, that these saltings may be applied to some very useful purposes; for example, if it be true that the distilled waters of some plants cannot be preserved from one year to another, notwithstanding they were prepared with every possible attention, it is equally certain, that these plants being well salted, need only be distilled when wanted, and may thus be used while all their medical virtues are in perfection.

INVENTIONS BY MR. R. TREVITHICK, RELATIVE TO NAUTICAL AFFAIRS.

1st. Account of a wrought Iron moveable Caisson, with a Rudder, for docking a ship, while riding at her moorings, without removing stores or masts.

This floating dock is made of wrought iron, half an inch thick, 210 feet long, 54 feet wide, and 30 feet deep, and will weigh about 400 tons; with a flanch six feet wide at the top, for the workmen to stand on, and to strengthen the caisson.

The weight of this caisson, when immersed in water, is nearly 350 tons; but for reasons, mentioned below, it is rendered nearly buoyant by an air receptacle, which surrounds it, and is capable of sustaining the whole weight with great exactness, and which is riveted to the caisson, in such a manner as to strengthen it, and support the principal props from the ship.

This caisson draws nine feet water; when taken to the ship intended to be docked, the water is to be let into it at an opening or plug-hole at the bottom, and it is suffered to sink till the upper part of it is even with the surface of the water. the air receptacle still keeping it buoyant. A small quantity of air is then to be discharged by opening a plug-hole in the air-receptacle, until a quantity of water is let in, just sufficient to sink the caisson, which is then to be drawn under the ship's bottom. This being effected, the caisson (nearly buoyant) is then to be raised to the surface of the water by ropes made fast from it to each quarter of the ship. A pump placed within the caisson and worked by a steam engine of a twelve horse power, placed in a barge alongside, will empty it in 3 hours, and reduce the ship's draught of water 8 feet; that is from 26 to 18 feet, (the caisson floating with a draft of 18 feet, while the ship floats with one of 26 feet.) She may then be carried into shoal water, if required, or alongside wharfs, or the jetty heads of the Dock-yards.

The ship's sides and bottom tending to fall outwards, by their own weight, and the sides and bottom of the caisson tending to be forced inwards by the external pressure of the water; it is obvious that by placing props or shores between them, both will be supported; while the ship will lie with all her stores on board, and masts standing nearly as easy as when floating in the water.

Should inconvenience be apprehended at any time from blowing weather, the caisson may be cast off, and let fall to the bottom, where it cannot be injured, and from whence it may be raised to the ship's bottom again at pleasure, with as little trouble as weighing an anchor.

The upper part of this floating dock will be 12 feet above water, when there is a first rate ship in it; this is a sufficient height to prevent the sea from breaking over.

By this means a ship may have her bottom examined and be out again in 6 hours; without coming above the Nore, and without undergoing the tedious process of unshipping and reshipping her stores, or waiting for spring tides or a fair wind, to enable her to reach to, or return from dock; which on an average now requires three months, accompanied with an expense of nearly £10,000 per month in wages, subsistence, &c. &c.

This plan may be practised in all countries, and must be particularly advantageous where there are no dry docks, or flowing tide.

Ships on many foreign stations, when requiring to be docked, are now obliged to be sent home, at a great expense of money, and waste of time, others being sent to replace them. This may be avoided in future. Iron Docks may be sent out from England in pieces of five or six tons, with the necessary rivets and bolts, ready to be put together whenever wanted.

A caisson capable of docking a first rate ship will not cost above nineteen or twenty thousand pounds (for merchantmen and smaller ships, the size and cost will be proportionally less). And judging from the duration of wrought iron salt-pans, will last twenty years without repair. When worn out it may be broken up, and will sell for one third of its original cost.

By adapting caissons to local circumstances, ships of war and merchantmen with all their stores and cargoes on board, can be carried to wharfs and storehouses, up rivers, where the depth of water is not above one half of the ship's draught. For example, in the river Clyde, the ships may be carried to Glasgow, instead of being obliged to unload twenty miles lower down the river.

2d. New System for Towing Ships; Floating Docks or Caissons.

The employment of Steam Engines (for impelling vessels) has no novelty: but however competent this agent is in other respects, it has generally failed in this branch of its application, not from its own incompetency, but from a defect in the communication required between the power and the water, upon which it is destined to act; and from not considering that a power, insufficient to move a vessel with others in tow, may be sufficient to move them alternately, that is to say, first the vessel containing

the engine, and then, by the communicating rope, the vessels which the first-mentioned vessel has to move.

A steam-engine of fifty tons weight on board a barge or ship, will tow with much greater power and effect, while only impelling a vessel forward by the action of the engine against the water, than a thousand men can do with sweeps. But if the same engine is applied to wind up a rope made fast to buoys, anchors or any other fixture, the power can be increased to any extent, at the expense of a loss of time nearly equal to the effect gained.

Many of the harbours in England are so situated, that the same wind which blows directly into the mouth of the harbour, is fair for going to sea. By placing buoys at about 400 yards from each other, this difficulty may be overcome with an engine of the above description, and men-of-war and transports might be towed out clear of the harbour in a short time.

This may be effected in the following simple manner. The steam engine will drive itself in the barge to the first buoy, where it will be made fast, at the same time paying out about 400 yards of tow rope, or less, as the case may require, one end being fast to the ship to be taken in tow, the other being fastened to a capstan, to be moved round by the power of the engine. This movement brings the ship up to the first buoy, where it is made fast, when the engine with the barge proceeds again to the next buoy, and so on, until the ship or ships in tow arrive at the outer buoy. In situations where there are no buoys, anchors may be dropped, and speedily weighed again, by means of the steam engine: but it is only in extreme cases that this routine is necessary. Generally the power of the engine will be found quite sufficient.

An apparatus of this kind will be useful in towing ships into action in light winds, in bringing off disabled vessels, also in propelling fire ships, against wind and tide after their crews have abandoned them; while by the same contrivance the look-out ships of a squadron, or packet boats, will be enabled to enter or leave a harbour in spite of wind or tide.

Remarks....,Two objections appear principally against the iron caissons. The first is the great expence; the £20,000 mentioned would build a graving dock in many situations, which would answer all the essential purposes of the caisson, and last ten times as long; and few would like to risk so large a sum without more certainty of advantage than what these caissons promise. The other objection to them arises from the danger of their adhering to the bottom when sunk. On muddy or sandy bottoms, it is well known that sunk ships adhere with a force vastly greater than their weight, and some of the few successful attempts which have been made in raising such vessels, have been owing to a due attention to this circumstance.

This adhesion arises from the water being forced out from between the vessel and the bottom; which causes the whole pressure of the superincumbent water to act in keeping it down; in the same manner as the pressure of the atmosphere acts in preventing the separation of two exhausted hemispheres in the well-known pneumatic experiment. If then the caisson lay in the bottom it would be subject to this accident as well as any other vessel: and the projector would find himself entirely mistaken in supposing it could be raised as easy as an anchor, as he has asserted. This evil might however be guarded against by proper management; so that the objection is not insuperable: floats or barges might for this purpose be attached to the caisson above, so as to prevent its sinking above 30 feet, or the depth requisite for admitting the vessel.

The plan of moving vessels by steam, deserves serious attention for several other purposes besides those mentioned. Two or more of this kind should be always stationed in time of war at Holyhead or Portpatrick, and the opposite ports; had some plan of this kind been adopted previous to the time, when the French fleet lay so long in Bantry-bay, the whole of it might then have been taken; for though the wind was such as to prevent vessels sailing to England during that period, it was perfectly fair for

the English fleet to have blocked up the French fleet in the harbour, if intelligence could have been sent over in time.

To bring this plan to perfection experiments must be tried that require much time, and will be very expensive, if not conducted with great caution. From some experiments tried by the writer on modes of impelling boats, which might be adapted to a steam engine apparatus, he is inclined to think that the floats, or parts that strike the water, have been made much too large hitherto in apparatus of this nature, the effect of which is to give motion to the water instead of to the vessel; as unless the floats move with a certain velocity through the water (which must depend on the ratio of their size to the impelling power) the resistence of the water, which is nearly as the squares of the velocity, will not be sufficiently great to cause the greatest re-action for the force used.

Oblique action is preferable also for this purpose to direct, in which the motion of the vessel takes off an equal quantity from that of the impelling surfaces. And it is to be observed that fishes move themselves in this manner; their tails which are their impelling instruments, always acting as inclined planes on the water, and with an oblique impulse.

A short Account of Mr. Davy's latest Experiments on Nitrogen, the Metals of the Earths, and Alkalies, &c.

In the third section of the Bakerian lecture, Mr. Davy detailed a number of laborious and minute experiments on the circumstances under which nitrous acid, and ammonia are produced. He showed that nitrogene is not formed by the electrization of pure water, and that in most of these cases in which it appears, it pre-exists in some compound, employed in the process. The facts in favour of the composition of nitrogene are those derived from the electrical experiments, upon the amalgamation of ammonia, and those derived from the action of potassium upon the same alkali. Mr. Davy brought forward various new facts and reasonings in support of the opinion that ammonia is an oxide.

In the fourth section several experiments upon the earths are detailed. Mr. Davy has succeeded in decomposing silex, alumen, and glucine, by means of potassium and iron, and has obtained amalgams of the metals of magnesia and lime by mere chemical agency. Potassium is sent in vapour through the earths ignited to whiteness, and Mercury is passed into the tube which unites to the new metals.

In the fifth section, Mr. Davy compares the antiphlogistic hypothesis of the nature of metallic bodies, with a modified phlogistic hypothesis, that they may be components of unknown bases with hydrogen, and he states that the decision upon these important points of doctrine, cannot be made, till perfectly correct notions upon the nature of ammonia, nitrogene, and hydrogen, are acquired.

Among other combinations before unknown, which Mr. Davy describes in this lecture, is a new inflammable gas, composed of the boracic basis and hydrogen.

ANECDOTES OF LEARNED MEN.

POVERTY OF THE LEARNED.

FORTUNE has rarely condescended to be the companion of merit. Even in these enlightened times, men of letters have lived in obscurity, while their reputation was widely spread; and have perished in poverty, while their works were enriching the booksellers.

Homer, poor and blind, resorted to the public places to recite his verses for a morsel of bread.

The facetious poet, Plautus, gained a livelihood by assisting a miller.

Xylander sold his Notes on Dion Cassius for a dinner. He tells us, that at the age of eighteen he studied to acquire glory, but at twenty-five he studied to get bread.